IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of: Ramesh Keshavaraj
Serial Number: 10/796,726
Filed: March 9, 2004
For: **Airbag Structure**
Group Art Unit: 3616
Examiner: Ruth Ilan

Commissioner for Patents
PO Box 1450
Alexandria VA 22313-1450

Certificate of Mailing Under 37 CFR § 1.8
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Date: October 12, 2007
Signature: Linda-ann Manley
Name: Linda-Ann Manley

DECLARATION OF INVENTOR RAMESH KESHAVARAJ

1. I, Dr. Ramesh Keshavaraj make this statement from my own personal knowledge. I am the inventor of the invention set forth in the above referenced patent application.

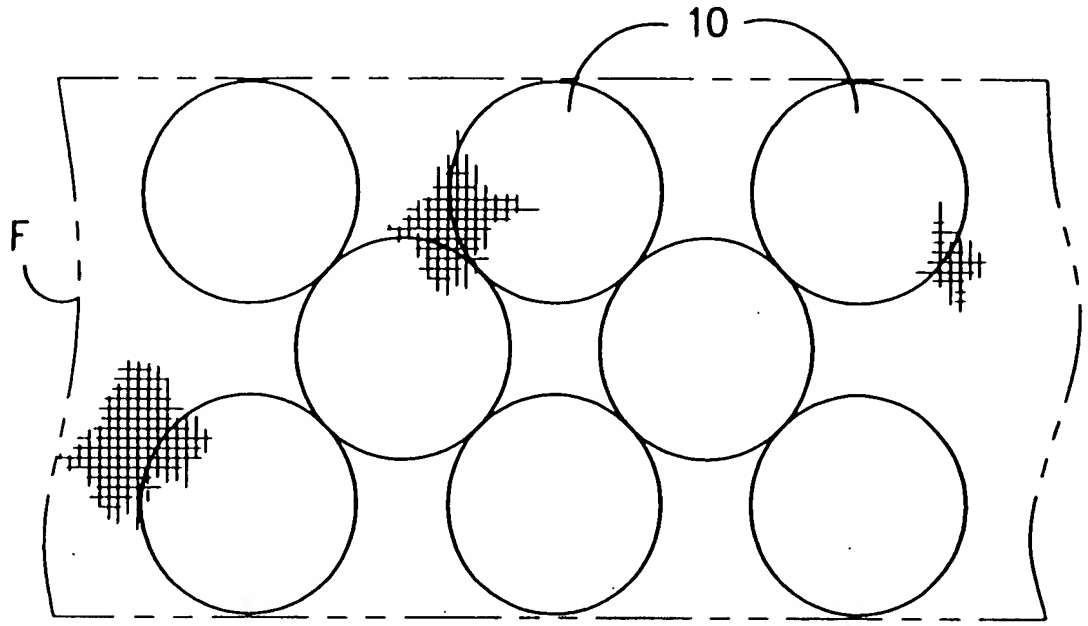
2. My education background is that I received a degree of Masters in Chemical Engineer in 1993 from the Texas Tech University. Further, I had additional education, receiving a Doctor of Philosophy degree in Chemical Engineering in the year 1995 from the Texas Tech University.

3. I am employed as a Global Technology Director in the Automotive Airbag Group for Milliken & Company ("Milliken) in La Grange, Georgia. I have personal knowledge of the facts stated in this Declaration.

4. In the past, before I made this invention, driver and front seat passenger airbags typically were made of circular shaped panels. When inflated, the airbag made of circular panels was symmetrical to provide protection for the occupant in case of

vehicular accident. The airbags also typically include internal tethers to control the excursion of the leading edge panel and help to provide the desired depth when inflated.

5. In the course of my research and engineering work, I realized that circular shaped panels do not "nest" well on a fabric. By that I mean that there is a large (and costly) amount of fabric waste in the use of such circular panels, when they are cut from a large piece of fabric, as shown below:



Thus, "nesting" of such airbags is only about 80-85%, that is, only about 80-85% of the usable fabric is used for the airbag, and the remaining areas of the fabric essentially are wasted, which is costly and inefficient. There was a long felt need in the airbag art for improved methods and airbag designs. I set out to improve upon the state of the art.

6. Later, polygon shaped panels were developed, which increased the nesting efficiency on fabric, and which further reduced cost. However, even with polygon shaped panels, there still was a need to further reduce cost and to increase the strength and inflation performance of airbags.

7. In airbag manufacture, it is important that an airbag does not fail when the airbag is explosively filled with gas almost instantly. This is a large force upon the fabric. In my work, I was looking for methods of increasing the strength of airbags. Circular airbags, I discovered, suffer from more than one weakness. That is, when the area near where the seam is sewed (the area where the warp and fill yarns are caught in the seam) is the weakest portion of the airbag perimeter. I discovered that only a very small length of yarn is caught in the process of airbag manufacture, in most instances, and as a result such a circular airbag with such sewn seams is capable of relatively easy and undesirable "yarn slip". "Yarn slip" is the undesirable slippage of yarn in the seam area, which allows gas to permeate the fabric (escape) through the seam. Yarn slip is illustrated below:

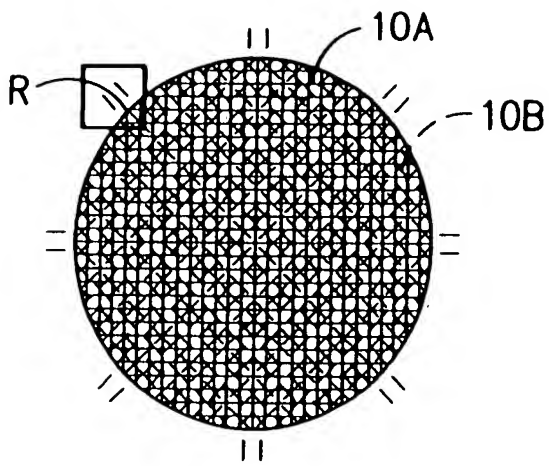


FIG. -3-

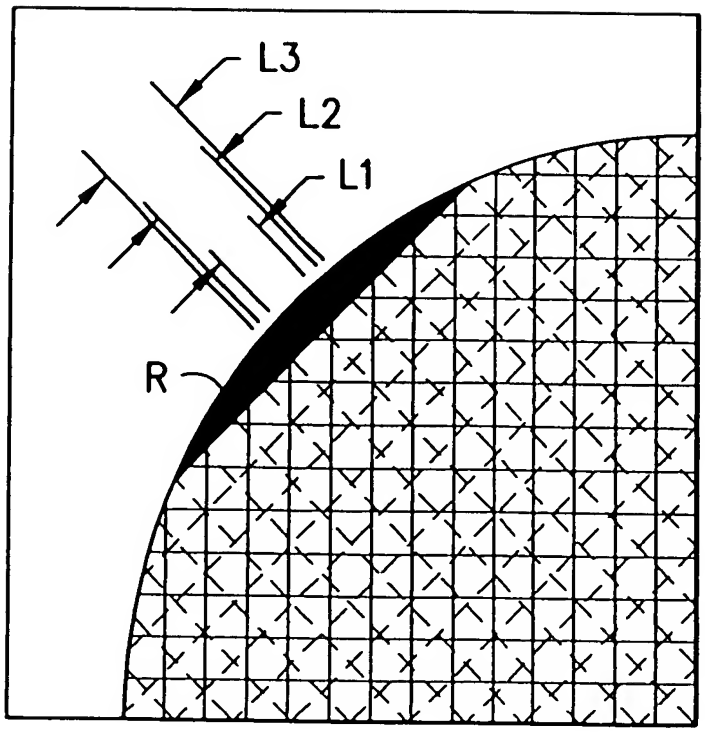


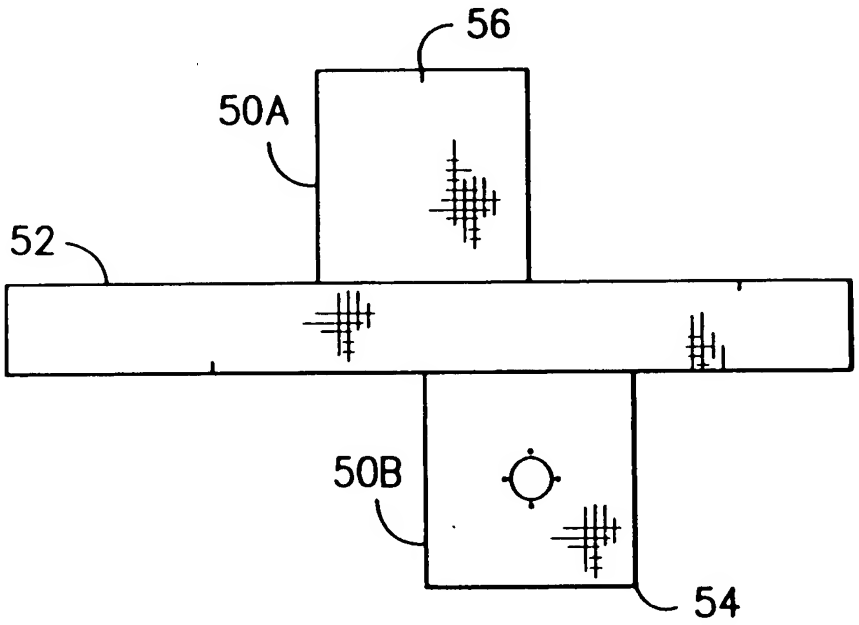
FIG. -4-

As shown in Figs. 2A and 2B of this patent application, cut panels such as that shown are used to form the conventional round airbags. As illustrated, two circular panels **10A**, **10B** are cut (defining front and rear panels), and in this case, they are rotated 45 degrees relative to each other so that fabric elongation can be optimized. (As will be appreciated by those of ordinary skill in the art, woven fabrics have the greatest elongation in a bias direction, rather than in the direction of the warp and filling yarns.) Although illustrated as being rotated 45°, it is noted that other bias angles could be used within the scope of the invention. Preferably, the angle will range from about 27° to about 65°. When the panels are seamed together, at eight evenly-spaced regions **R** on the periphery of the circle, only a yarn or two of one of the fabric layers is caught within the seam. As shown at the lengths **L1**, **L2**, and **L3**, only minor portions of the panel **10B** are caught within the seam. As a result, the strength of the airbag at those eight points **R** is compromised, such that those points define weak spots susceptible to heat erosion and seam combing. Because of the round shape of the prior airbags, it has previously been impossible to avoid these weak spots. I understood this problem and began a search. I was looking for a way to improve upon this airbag design shown here, and my work in this area resulted in the invention of this application.

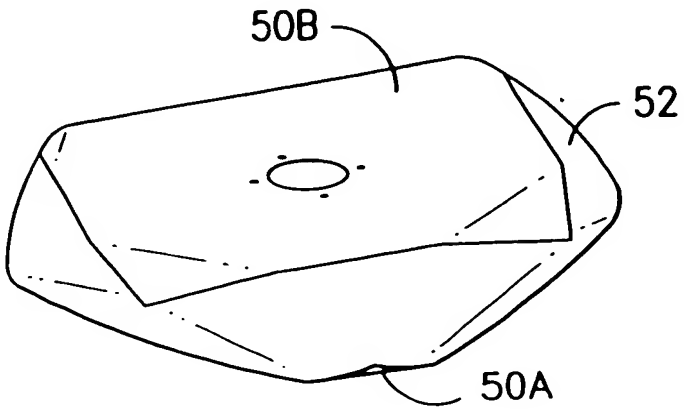
8. On the other hand, the invention of the present application, which is described below, was reduced to practice in the United States (in Georgia) prior to January 14, 2004. Attached in an invention record dated December 15, 2003 which shows the reduction to practice of the invention. Further, it references the lab notebook entries and CAD drawings that were prepared on about October 7, 2003. The invention record was signed and witnessed on December 15, 2003. It also was notarized on December 15, 2003.

9. As one particular application of the invention, I discovered and proposed the use of rectangular or square shaped panels in this context, that could be used as described in the patent application, at a bias to each other. Such panels would be stronger, because the seam areas would play along the axis of maximum strength, namely the warp and fill directions. The seam junctions would be connected in the

maximum strength direction, but when inflated, all the seam junctions act at bias to provide better energy absorption and thus tend to be structurally more robust. The illustrations below shown this design, as compared to typical prior art circular panels. The square panels (as one example of the invention) may be cut with a peripheral side panel extending between the front panel and rear panel. This is seen below, in Figure 14 of the patent.:

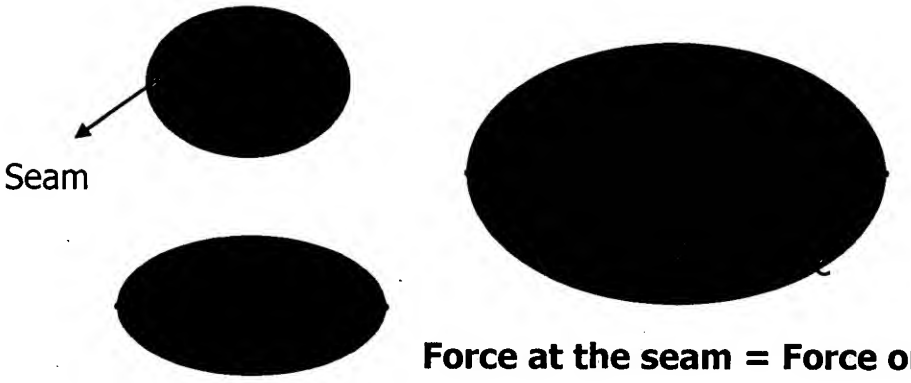


Triangular panels are also contemplated in the scope of the invention. Square or rectangular panels may be placed at a bias form a seam that appears in a zig-zag fashion when a fully sewn airbag is shown, as in Figure 15 of the patent (see below)

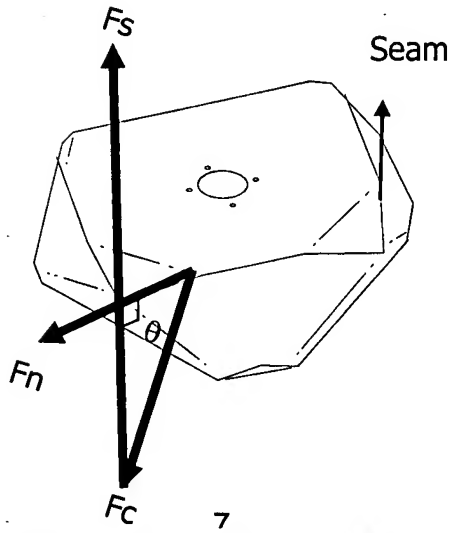


10. One reason that non-circular panels are stronger and therefore more desirable is that such panels are oriented to maximize the strength of the woven fabric. Furthermore, there are a greater number of yarns at the seam junctions at the right orientation, which minimizes the chances for undesirable seam separation. Further, the invention reduces the force at the seam that is transmitted from the fabric deformation during deployment as depicted in the following schematics:

Current Design



Force at the seam = Force on the fabric



Force at the seam = 0.5 x Force on the fabric

Further, the use of this invention allows a greater nesting configuration, which reduces the amount of waste generated in fabric layout and cutting operations.

11. The use of the invention of non-circular panels has provided unexpected results as compared to prior art circular shaped panels. Furthermore, the desirability of non-circular panels in the context of this invention is without question. Given the long felt need for better airbag designs, it is further proof of the non-obviousness of this invention. I was not aware of any market trend towards non-circular panels at the time I made this invention. Further, there was no real awareness in the prior art of the problem solved by the claims. To my knowledge, I was the first to see this problem, and solve the problem. It is not predictable that one can alter the geometry of panels and by doing so, achieve a stronger and more effective airbag at less cost. This result is unexpected, in my view.

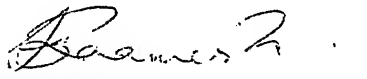
12. I reviewed the patent Office Action mailed on March 9, 2004 and the prior art references cited therein.

13. The Bauer reference clearly and without question discloses a cylindrical shaped airbag. Bauer does not disclose non-circular front and rear panels, and instead, it discloses in Figures 5, and Figures 6-8 circular panels. Further, there is no disclosure in Bauer of non-circular panels that are cut so as to be disposed between a peripheral side panel that is connected to each side panel. Due to its configuration, Bauer suffers from some of the same drawbacks as much of the rest of the circular panel prior art. That is, Bauer does not solve the problem of inefficient nesting of circular side panels, as described herein. Thus, there is no reason to believe that the "nesting" of the Bauer airbag portions would be any greater than the conventional circular nesting patterns, that is, and is likely no more than about 80-85% of the usable fabric is used for the airbag. The problem and cost of the relatively large remaining areas of the fabric that are wasted is not solved by Bauer.

14. The Bauer reference also is not adapted for solving the problem of weakness in the seam area, due to circular geometry with regard to yarn slip. The area near where the seam is sewed (the area where the warp and fill yarns are caught in the seam) is the weakest portion of the airbag perimeter. With circular airbags, only a very small length of yarn is caught in the process of airbag manufacture, in most instances, and as a result such a circular airbag with such sewn seams is capable of relatively easy and undesirable "yarn slip". "Yarn slip" is the undesirable slippage of yarn in the seam area, and based upon the design of Bauer, it is likely to suffer from yarn slip as do other conventional airbags with circular panels.

15. Bauer teaches away from the invention. Bauer teaches the use of an "elongated shape that allows the airbag to inflate rapidly". The airbag of the present invention is *not* elongated. In fact, the airbag of this invention, as seen in Figure 15 of the specification of this patent, does not show an elongated shape at all. In fact, the use of rectangular or square panels, in the invention, instead of circular panels as in the prior art, causes a shape that is *less* elongated. Thus, Bauer teaches directly away, and directly opposite to that of the invention.

16. All statements set forth herein are made of my own knowledge and are true, and all statements made on information and belief are believed to be true. I make these statements with the knowledge that willful false statements are punishable by fine or imprisonment, or both, and may jeopardize the validity of the application or any patent issuing thereon.



Ramesh Keshavaraj

10/12/07

Date

5714

DESCRIPTIVE TITLE

TITLE of the Invention Airbag made from polygonal panels with less than 5 sides

INVENTOR INFORMATION

The information in this section will help the Legal Department (1) complete paperwork required by the USPTO; (2) prepare an assignment check for the inventor(s); and (3) notify the appropriate business leaders of this submission. Please list the names of each inventor's division and business leaders. (Their signatures are not required.)

INVENTOR	INVENTOR 1	INVENTOR 2	INVENTOR 3	INVENTOR 4
Full Name	Ramesh Keshavaraj			
Associate #	17828			
Social Security #				
Citizenship	India			
Residence (Street, City, State, and County)	305 Grovewood Lane, Peachtree City, GA-30269			
Job Location and Mail-stop	MDC, M-821			
Direct Supervisor	Dennis Riddle			
Business Mgr.	Jack Richardson			
Division Pres.	Ken Compton			

INVENTION INFORMATION

Type of Invention
(Check all that apply.)

- θ Product / Article of Manufacture
- θ Process / Method
- θ Machine / Apparatus / Device
- θ Compound /Composition of Matter

Economic Value
(estimated 5-year potential, based on bottom-line profit, not sales)

- θ A (Greater than $10,000,000)
- θ B (Greater than $1,000,000)
- θ C ($100,000 to $1,000,000)
- θ D ($ 10,000 to $100,000)

Recorded Date of Invention

What is your earliest written record of this invention? (Include notebook page #'s.)

Notebook #: ABC WORK & CAD DRAWINGS.

Page #'s: _____

Date: 10/7/03

DISCLOSURE OF THE INVENTION

Has the invention been shown or described to non-Milliken personnel? θ YES θ NO
(If YES, answer questions in the left column below. If NO, answer questions in the right column below.)

If YES, on what date? _____

If NO, is there an upcoming (or planned) use, disclosure, or offer for sale? θ YES θ NO

If YES, what was the nature of the disclosure?
- θ Shown or described to non-Milliken personnel
- θ Commercially used
- θ Offered for sale / sold

If YES, what is the nature of the planned disclosure?
- θ Will be shown or described to non-Milliken personnel
- θ Will be used commercially
- θ Will be offered for sale or sold

If the invention was shown, was a confidentiality agreement in place? θ YES θ NO

On what date will the above activity occur? 12/19/03 to TRW, under Confidentiality Agreement.

If a confidentiality agreement was in place, state the name of the other party.

_____

NOTICE: If a patent application is not filed with the Patent Office before your invention is publicly disclosed, then you may have forfeited the right to seek foreign patent protection.

PROJECT NAME

If there is a **project name**, list here: LIFEPAC +

LEGAL DEPT. USE ONLY

Attorney _____ Proposed Deadline Date _____

BUSINESS INFORMATION

DIVISION / SEGMENT *(Pick one)*

θ Air bag	θ Fashion Fabrics	θ Industrial Specialties – Europe	θ Performance Products
θ Automotive	θ Floor Covering / Kex	θ Industrial Specialties – U.S.	θ Research
θ Chemical	θ Greige Fine Goods	θ Milliken Textured Yarns	

DEVELOPMENT TEAM *(Pick one or check here: θ Not applicable)*

θ Air bag	θ Cotton & Cotton Blend	θ Milliken Sommer	θ Performance Chemical	θ Specialty Industrial
θ Automotive	θ Engineered Fabrics	θ Milliken Textured Yarns	θ Process Chemical	θ Synthetic Woven
θ Circular Knit	θ Floor Covering	θ Millitron	θ Rental Uniforms	θ Table Linen
θ Coated Products (Packaging)	θ GFG – New Ventures	θ Napery	θ Research	θ Technical Industrial Fabrication
θ Contract Fabric	θ Kex	θ New Concepts	θ Specialty Chemical	θ Woven Automotive

BUSINESS UNIT *(Pick one. If a second business is involved, please mark box and indicate #2. If invention relates to a improvement in manufacturing operations, please mark the box for "plant improvement.")*

θ Abrasive substrates & eng. products	θ Carpet – Earth Square	θ Composite Fabrics	θ Industrial - Specialty	θ Tennis WSP
θ Air bags - Europe	θ Carpet - Hospitality	θ Contract & decorative fabrics	θ Kex (Denmark)	θ Uniforms – Rental
θ Air bags – U.S.	θ Carpet – Hospitality (Int'l.)	θ Cotton & cotton blend	θ Kex (Japan)	θ Uniforms - Specialty
θ Automotive (Chrysler)	θ Carpet (Int'l.)	θ Drapery	θ Kex (U.S.)	θ Viktor Achter
θ Automotive (Ford)	θ Carpet - Millitron	θ Elastic fabrics	θ Lockhart Power	θ WOM
θ Automotive (GM)	θ Chemicals – Performance (Int'l.)	θ Engineered perf. products	θ Millicare	θ Yarn - Sales
θ Automotive (Int'l.)	θ Chemicals – Performance (US)	θ GFG Acetate	θ Milliken Sommer	θ Yarn - Textured
θ Carpet & rug	θ Chemicals – Process / Capture	θ GFG Nylon	θ Napery	
θ Carpet – Commercial(Europe)	θ Chemicals - Specialty	θ GFG Specialty	θ Synthetic Woven	θ Plant improvement
θ Carpet –Commercial (Japan)	θ Circular Knits	θ Industrial (Europe)	θ Table Linen	θ Other:
θ Carpet – Commercial (U.S.)	θ Coated Products (Packaging)	θ Industrial - Fabricating	θ Technical / Industrial	

USE STATUS *(Check one to indicate the current status of the invention.)*

θ Currently in use Date started:_____	θ Planned use Date planned:_____	θ Not in use	θ No planned use, but may block competitor

LOCATIONS where used or where use is planned *(Check all that apply.)*

θ Abbeville	θ Dewey	θ Hillcrest (Sommer)	θ McCormick	θ Pine Mountain
θ ABC - Stearns	θ Duncan Stewart	θ Hillside	θ Midway	θ RMC
θ ABC - Winfield	θ Elm City	θ Honea Path	θ Milliken Design Center	θ Saluda
θ Alma	θ Enterprise	θ Humphrey	θMilliken Packaging-Jonesville	θ Sharon
θ Avalon	θ Excelsior Union	θ Johnston	θMilliken Packaging-Whitestone	θ Sibley
θ Barnwell	θ Gayley	θ Judson	θ Monarch	θ Sycamore
θ Cedar Hill	θ Gerrish Milliken	θ Kex	θ New Holland	θ Unity
θ Cotton Blossom	θ Gillespie	θ Kingsley	θ Newton	θ Valway
θ Cushman	θ Gilliland	θ Kingstree	θ Pacolet	θ Other: AUTOTEX NOVA-LINK.
θ Cypress	θ Golden Valley	θ Live Oak	θ Peerless	
θ Defore	θ Hatch	θ Magnolia	θ Pendleton	

Please describe the invention and its operation in the space below and on additional pages if necessary. (Attach copies of any drawings, sketches, or blueprints that have been created.)

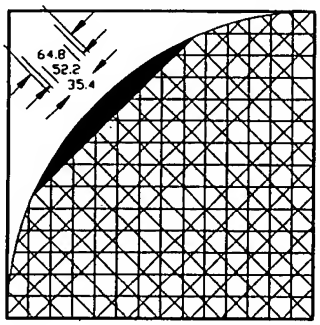
Driver airbags are made from circular shaped panels because when inflated, the resultant airbag provides perfect symmetry to protect the occupant in case of an accident. These airbags also employ internal tethers to control the excursion of the leading edge panel and help to provide the desired width for the airbag when inflated. The circular shaped front and back panels do not nest well on a given width of fabric and as a result the nesting efficiency is not very good. Typical driver airbag nesting efficiency range between 80 to 85 percent even though the rest of the bag components like the tethers and reinforcements are nested in the space created between the circular pieces. As a result polygon shaped bag panels (front and back) with more than five sides were proposed by the inventor in order to improve the efficiency of the nest and such bags have been in production for several years.

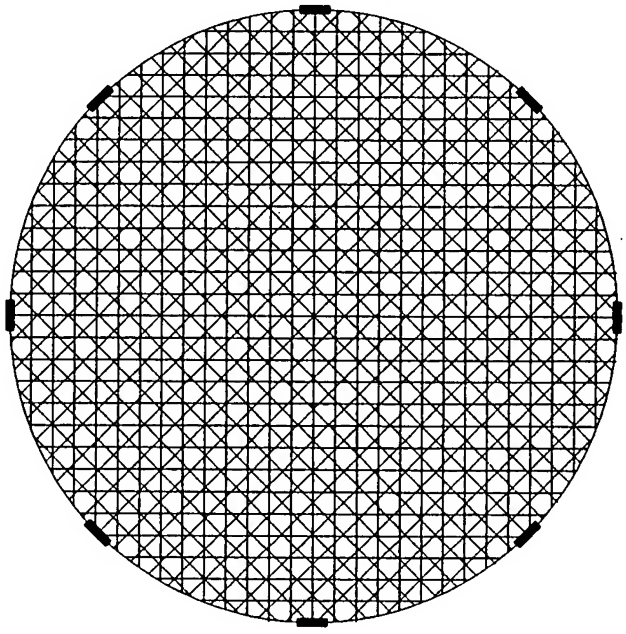
The two fabric panels, namely front and back are offset depending on the edge in case of polygons or circular panels when sewn such that the increased elongation that is attained in the bias angle of the fabric is compensated. In the case of the circular panels for example the two panels are offset at 45 degrees such that the warp/ fill yarns of the front panels mate to the bias direction of the warp or fill yarns. Since these bags have to be symmetrical, polygons less than five sides have not been explored before as these bags are sewn in a flat configuration.

Considering the constraints posted by the two dimensional (load-bearing axis) nature of the woven fabrics and the ultimate inflated three dimensional shape of the airbags, a method is proposed whereby polygons with four sides (square or rectangle) can be used to sewn a symmetrical three dimensional airbags. This methods further allows to reduce cost by improving the nesting efficiency and reduce the amount of fabric used per cushion of given volume.

Structurally the airbags made from square shaped panels would be stronger because the seam areas are going to be play along the axis of maximum strength, namely the warp and fill directions. The seam junctions are going to be connected in the maximum strength direction, but when inflated, all the seam junctions act at bias to provide better energy absorption and hence tend to be structurally more robust. The following schematics help understand the logic of this design.

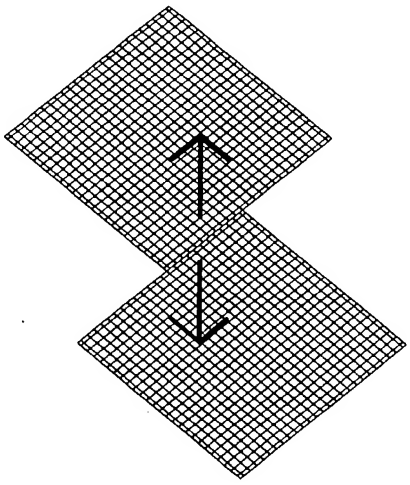
In the case of the prior art where the airbags are made from circular shaped starting pieces, the area near the seam where the warp or fill yarns get caught is the weakest section on the perimeter of the airbag. Only a very small length of the yarn gets caught in the process and as a result is capable of easy yarn slip as shown below





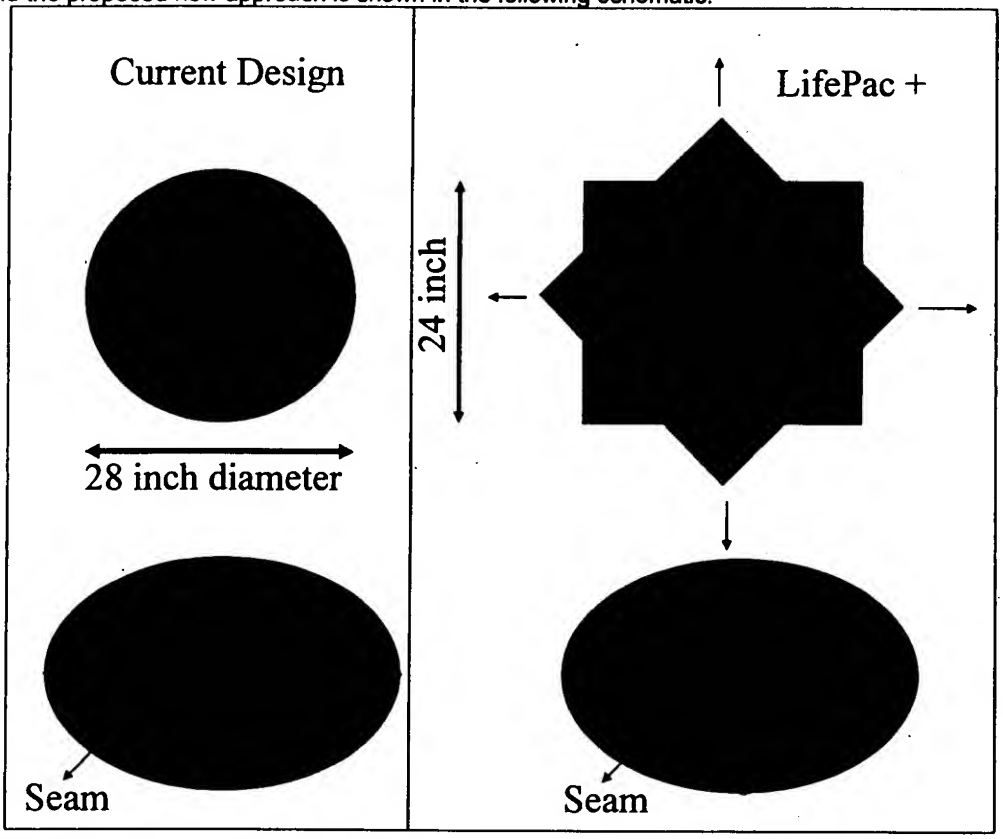
There are eight such weak spots on the entire bag as shown above, but the one on the front panel are more detrimental because of gas erosion path when the bag expands. This is hard to overcome because of the two-dimensional woven fabric being used to form a three dimensional airbag.

On the contrary, in the case of the airbag constructed from square shaped panels, they are connected as follows:



Arrow indicates the direction of fabric deformation during deployment.

Accordingly, cushions in the case of driver airbags can be made from square shaped starting panels and the details of the prior art and the proposed new approach is shown in the following schematic.



In the above example, the inflated volume of the cushion was targeted at 52L with a internal tether of 11 inches. In this examples the panels diameter in the circular panels as done today would requires a diameter of 28 inches, but with the new approach the squares have to be of a length of 24 inches.

The steps involved in designing bags form square shaped starting panels needs to take into account that the area of the square panels always have to be smaller (~6.4%). The details of the steps involved in sewing needs further explanation as it is not obvious from the above sketch, hence the following steps are used to illustrate the process.
All the square panels are cut parallel to the warp/ fill yarn to improve the nest efficiency. Two square panels are required to make a bag. Step 1. Rotate one square panels by 45 degrees such that each corner of the first square would meet the center of each side of the second square. Step 2. Sewn a continuous seam to attach the center of each side of the second square to respective corners of the first square. The finished bag would have a seam that looks like a zig-zag sew once the airbag is inflated.

As mentioned before the seam connects the panels in the direction of maximum strength and lowest elongation (aligned to warp or fill) , but when the bag expands the top and bottom panels are going to be pulled in the bias (45 degrees) as indicated by the arrows on both panels in the above schematic. There is equal strain and stress across the entire perimeter of the inflated airbag as compared to the prior art. This new approach not only eliminates the stress risers, but makes the bag more robust. Airbags can be made from triangular shaped panels as well.

What is the object or purpose of the invention?

The purpose is to make a airbag that is economical by improving the fabric usage efficiency and also, to make a robust bag compared to prior art. A nesting comparison on the parts for each of the case is provided in the attached diagrams where the efficiency is improved from 82.57% to 94.82 % (12.25% improvement) and the fabric usage per bag is reduced from 0.76 linear yards to 0.58 linear yards (23.6% improvement).

What problem does the invention solve?

Helps to take advantage of lower cost fabrics that would not have been possible in the airbag made from prior art.

What are the advantages of the invention, particularly when compared with others' attempts?

Improved efficiency, lower cost and robust bag

What further research is intended? What further testing or trials are planned?

Internal testing underway. Plan to take it to the customer early next year.

QUESTIONS ABOUT OTHERS' EFFORTS (PRIOR ART)

Identify and describe any technologies related to this invention (either within or outside Milliken). Include information found in patents or other literature.

Polygon shaped panels were developed by the inventor for a similar application.

Have you conducted a search of patents or other publications (or has someone else conducted a search on your behalf)? θ YES θ NO

What resources were used to conduct the search? ***(Check all that apply.)***

- θ ✓ US Patent & Trademark Office (www.uspto.gov)
- θ ✓ Derwent
- θ ✓ IBM Web-site (www.patents.ibm.com)
- θ Sci-Finder (chemical patents only)
- θ ✓ Milliken patent database (on Lotus Notes)
- θ Other _____

INVENTOR SIGNATURE(S)

I understand that the completeness and accuracy of the information provided herein may be used as evidence to establish Milliken's title to this invention. This information is provided on this 15th **day of** December, 2003.

Inventor 1 Baames2. **Inventor 2** _____

WITNESS SIGNATURES

This invention has been explained to, and is understood by, the undersigned who have witnessed the signatures of the inventor(s) above.

Witness 1 Thos E Dfp.	**Witness 2** Derek L Bowen
Printed Name Thomas E. Davenport, Jr.	**Printed Name** DEREK L BOWEN

NOTARY SIGNATURE

Sworn to before me this 15th day of December, 2003

Notary Signature: Carla S Rhodes

Notary for Georgia My commission expires My Commission Expires August 15, 2006

DIVISION AUTHORIZATION

H A Docket Number will not be assigned without Division-level approval. H
H No action will be taken on this Invention Record until ALL requested information has been submitted. H

θ Have an outside search conducted θ Prepare a patent application θ Evaluate for new product clearance θ Other _____	Authorization Signature _____ Date _____

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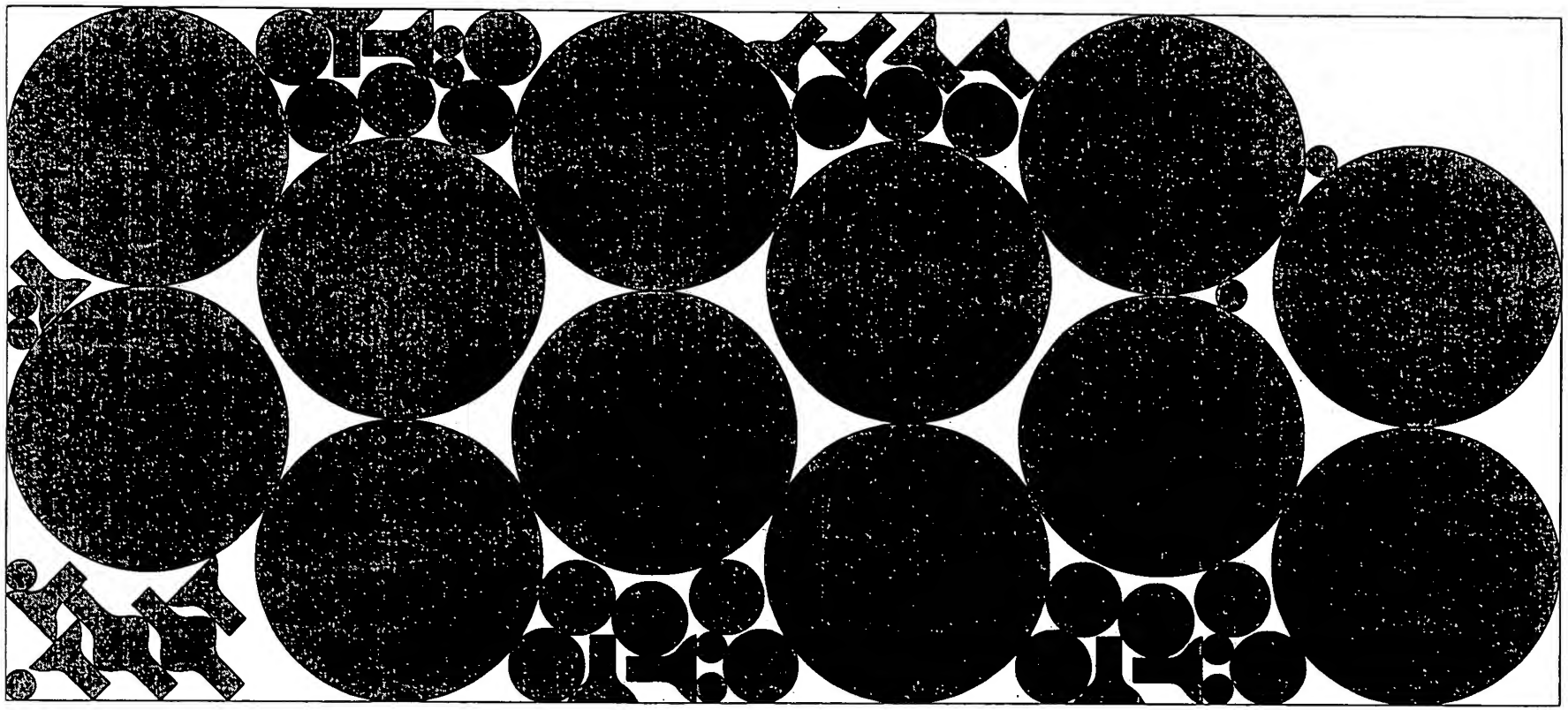
Tue Dec 09 10:12:24 2003
Prepared By : N/A, At : N/A
Tool : 'GMT345-DAB-Petal'
Rot 90, H-Flip Y, V-Flip Y, Gap 0.00, R-Tilt 0.00, L-Tilt 0.00, T-Salv 0.00, B-Salv 0.00
770SAB

Nester
Software Technologies, Inc.



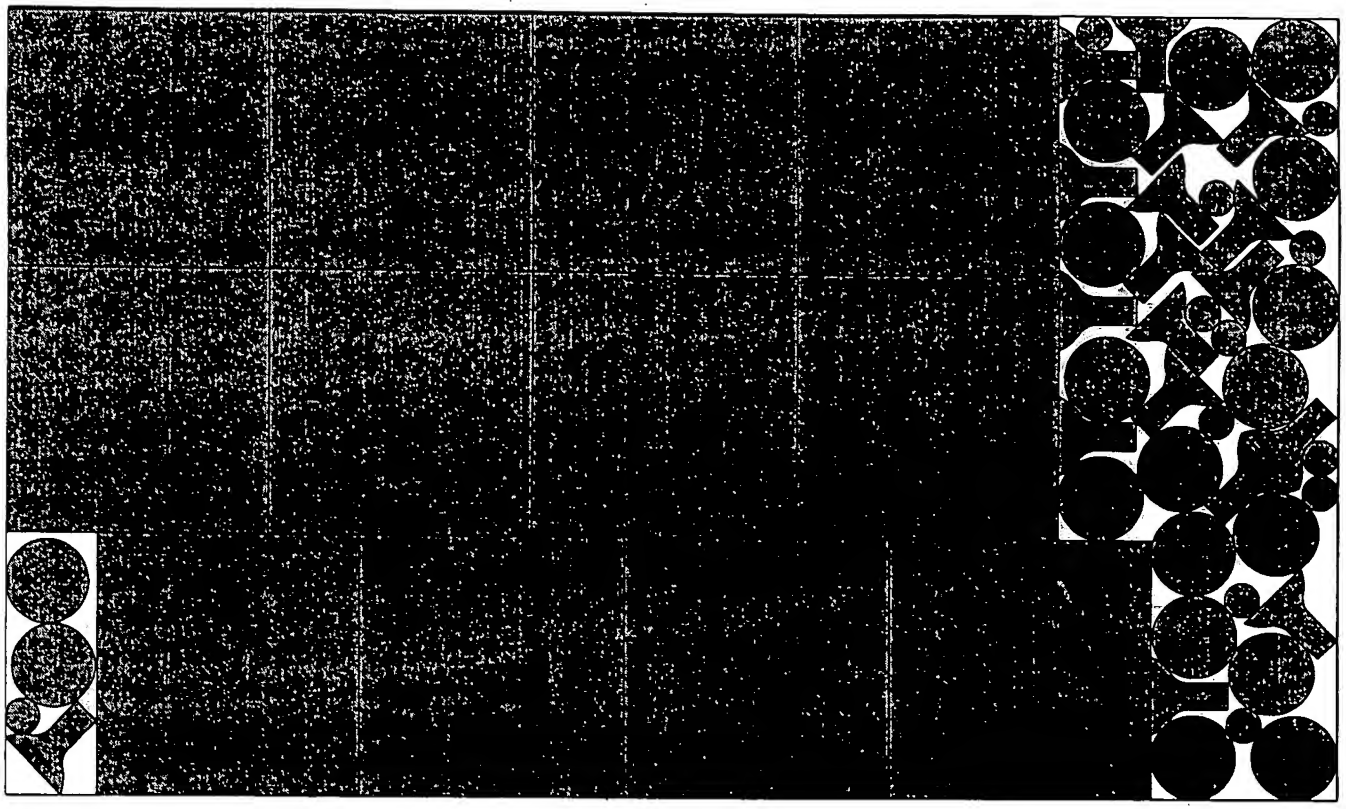
Material Width	: 190.50 cm	Nest Length	: 422.150cm	Nest Width	: 190.50 cm
Number of Jobs:	1	Yards Per Job	: 4yd,22.201in	Efficiency	: 82.57%
Progress	: 60/60	Border Length	: 5632.31 cm		

Piece name	Size	Nested Quantity	Perimeter
TER-5		6	1462.58 cm
R-6		6	1462.47 cm
-0		6	407.05 cm

Made by NESTER version 5.55.010214
The Automatic/Interactive Marking System

Tue Dec 09 10:12:32 2003
Prepared By : N/A, At : N/A
Tool : 'GMT345-DAB-Petal'
Rot 90, H-Flip Y, V-Flip Y, Gap 0.00, R-Tilt 0.00, L-Tilt 0.00, T-Salv 0.00, B-Salv 0.00
770SAB

Nester
Software Technologies, Inc.



Material Width : 191.00 cm	Nest Length : 321.370cm	Nest Width : 191.00 cm
Number of Jobs: 1	Yards Per Job : 3yd,18.524in	Efficiency : 94.82%
Progress : 60/60	Border Length : 5755.27 cm	

Piece name	Size	Nested Quantity	Perimeter
STER-3		6	1524.00 cm
TER-4		6	1524.00 cm
-0		6	407.05 cm

-23%

Made by NESTER version 5.55.010214
The Automatic/Interactive Marking System

Mon Dec 15 08:19:33 2003
Prepared By : N/A, At : N/A
Tool : 'GMT345-DAB-Petal'
Rot 90, H-Flip Y, V-Flip Y, Gap 0.00, R-Tilt 0.00, L-Tilt 0.00, T-Salv 0.00, B-Salv 0.00
770SAB

Nester
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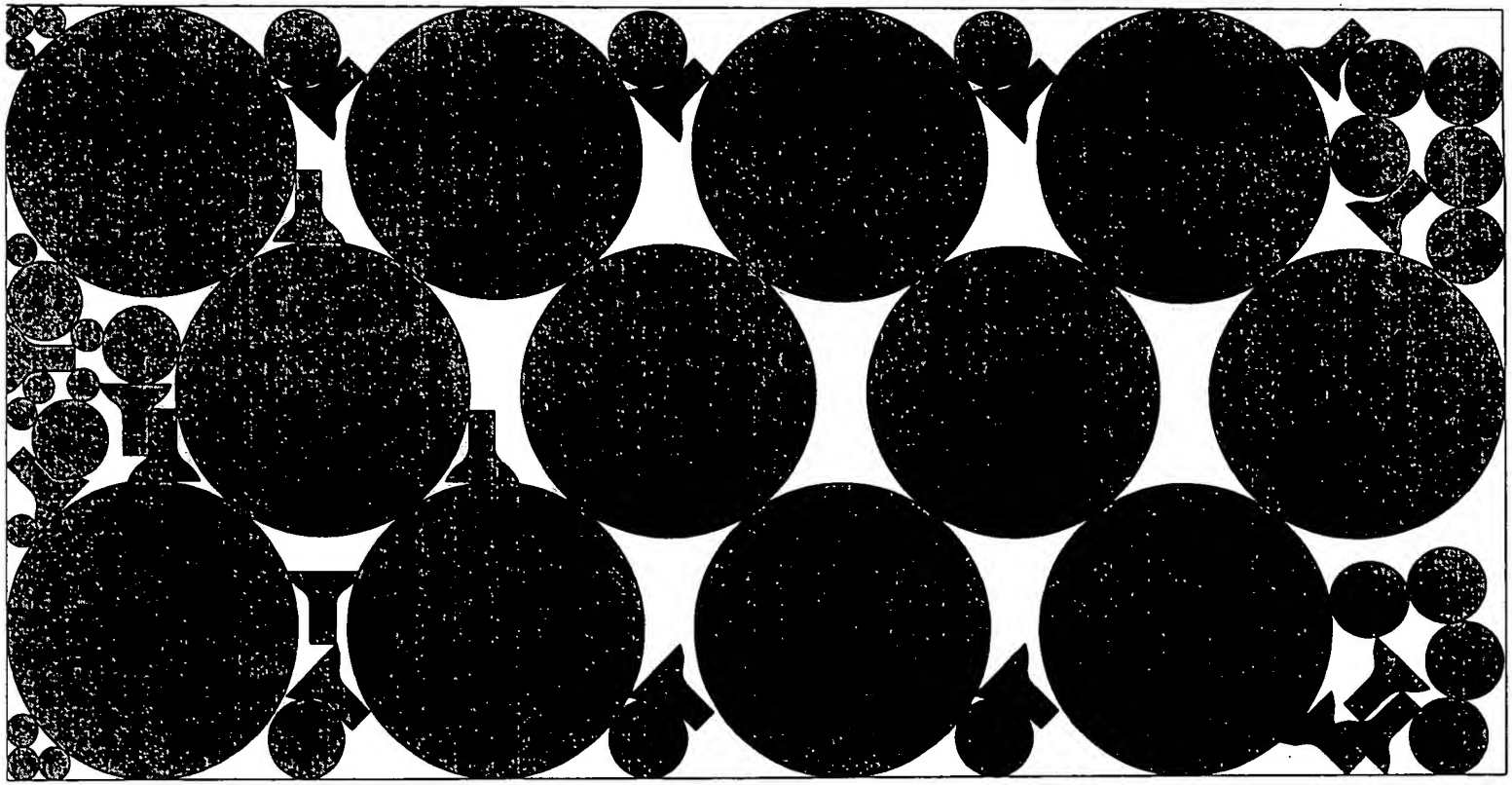


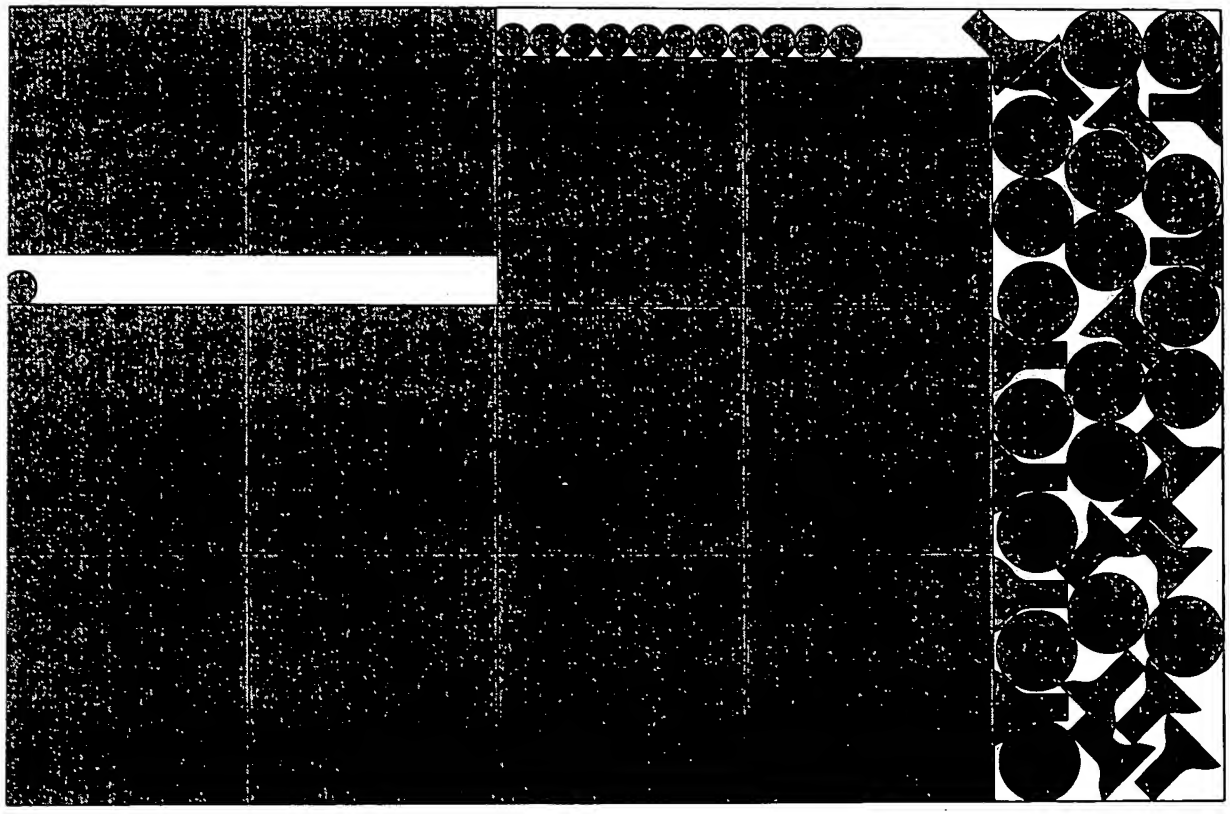
Material Width	: 203.20 cm	Nest Length	: 395.010cm	Nest Width	: 203.20 cm
Number of Jobs:	1	Yards Per Job	: 4yd,11.516in	Efficiency	: 82.73%
Progress	: 60/60	Border Length	: 5632.31 cm		

Piece name	Size	Nested Quantity	Perimeter
STER-5		6	1462.58 cm
ER-6		6	1462.47 cm
-0		6	407.05 cm

Made by NESTER version 5.55.010214
The Automatic/Interactive Marking System

Mon Dec 15 08:19:44 2003
Prepared By : N/A, At : N/A
Tool : 'GMT345-DAB-Petal'
Rot 90, H-Flip Y, V-Flip Y, Gap 0.00, R-Tilt 0.00, L-Tilt 0.00, T-Salv 0.00, B-Salv 0.00
770SAB

Nester
Software Technologies, Inc.



Material Width	: 203.20 cm	Nest Length	: 313.100cm	Nest Width	: 203.20 cm
Number of Jobs:	1	Yards Per Job	: 3yd,15.268in	Efficiency	: 91.48%
Progress	: 60/60	Border Length	: 5755.27 cm		

Piece name	Size	Nested Quantity	Perimeter
NESTER-3		6	1524.00 cm
NESTER-4		6	1524.00 cm
NESTER-0		6	407.05 cm

- 20.1